

other to the westward. Dense masses of steam and smoke rose from the courses of the lava streams, as the shrubbery and foliage were burnt. The river Guacalate rose suddenly, and its waters were quite warm. Fuego continued to belch fire until daylight, by which time the whole northern horizon, looking from San José, was dark with the smoke from the volcano. The lava streams continued in view until 4.30 a.m. The first grand column of fire rose at least 500 feet in height, solid and smooth, and then the top, expanding, opened out like an umbrella, the sparks coruscating like those from a brilliant rocket. The pulsations of flame during the first two hours of the eruption were about 50 seconds apart, strong and regular. The eruption was less active until, at 7.30 p.m. on July 1, a column of flame rose to a height, probably, of 150 feet or more. At the hour of writing Fuego smokes away steadily."

A REMARKABLE thunderstorm is reported as having occurred on July 24 last at Moylough, county Galway, Ireland. The storm, which was very vivid and accompanied by a most destructive fall of enormous hailstones, lasted about an hour and a half. One of the strongest discharges took place in a field about a mile from Moylough Church. The spot is described as presenting on a large scale an appearance like that of a sheet of cardboard that has been pierced by the discharge of a battery of Leyden jars. A long branching furrow, upturned as if by a plough, was found, a deep hole being bored at each end of six terminal branches, the earth round the holes being raised as if pushed up from below. Tufts of grass were scattered thirty and forty yards from the place.

MR. W. BRANKSTON RICHARDSON, writing from 61, Sutherland Gardens, Maida Vale, sends the following dog-story to the *Times*:—"Concurrently with the forty days' fast of the misguided American doctor, another fast has been in progress in our own country, for the truth of which I myself can vouch. A friend of mine who lives in Devonshire left home some weeks since on a series of visits to his friends in distant parts of the country. A few days after he left his servants wrote him that a favourite Skye terrier was missing. My friend, after every search had proved fruitless, considered that the dog had been stolen. On his return home, after an absence of one month and five days, he unlocked the library, the doors and windows of which had been bolted and barred during his absence, and to his astonishment the missing dog crept out into the light, a living skeleton and totally blind. He was well cared for, and has now quite recovered his health and sight. But his existence was wonderful. He had had no food and no water, and had not gnawed the books or obtained sustenance from any source whatever."

It is at present too early to offer an opinion as to whether "Brook's Popular Botany: comprising all the Plants, British and Foreign, most useful to Man in Medicine, Food, Manufactures, and the Garden," is likely to answer to its title, since so much depends on its completeness. In the two numbers which we have at present received the letterpress seems fairly accurate, if not scientifically precise; but the illustrations are on too small a scale, and altogether wanting in detail. The publication is at all events cheap enough.

THE City of Nancy has instituted at its own expense a competition among aeronauts. A premium of 80*l.* has been offered to the aeronaut who on an ascent made from Nancy shall have made the best observations. MM. Eugène Godard and Duruof have entered the lists.

IN the beginning of September a statue erected to Pascal by public subscription will be inaugurated at Clermont. The principal address will be delivered by M. Bardoux, ex-Minister of Public Instruction, and member for Clermont.

EVERY year the laureates of the Municipal Schools of Paris travel during their holidays at the expense of the Municipality. The pupils of the Turgot School will visit Chambéry, those of the Lavoisier School, Havre, and those of the Colbert School, Chambéry. The pupils of the J. B. Say School will go to Clermont-Ferrand and witness the inauguration of Pascal's statue.

M. MAURICE KOECHLIN of Mulhouse, although born deaf and dumb, has passed successfully his examinations for baccalaureat at Rouen. He was educated by M. Hugentobler, director of an institution for such unfortunate persons. This young man is only sixteen years old, and his wonderful success has created quite a sensation.

THE Sixth Annual Report of the Yorkshire College for 1879-80 speaks with satisfaction of the progress of that institution. Instruction is now given in fourteen distinct subjects by twelve professors, lecturers, and instructors, aided by nine assistants. The number of students had increased to 142 from 113 of the previous year; there were besides 52 medical and 148 occasional students.

THE additions to the Zoological Society's Gardens during the past week include two Lesser Black-backed Gulls (*Larus fuscus*), British, presented by Mr. Beazley; a Horned Lizard (*Phrynosoma cornutum*) from Texas, presented by Mr. Luiz de Tavaris Ozorio, a Red-handed Tamarin (*Midas rufimanus*) from Surinam, two Russ' Weaver Birds (*Quelea russi*) from West Africa, deposited; a Servaline Cat (*Felis servalina*), a Coquetoon Antelope (*Cephalophus rufilatus*) from West Africa, a White-cheeked Capuchin (*Cebus lunatus*) from Brazil, four Brown Capuchins (*Cebus fatuellus*) from Guiana, two Swainson's Lorikeets (*Trichoglossus nove-hollandiae*) from Australia, an Anaconda (*Eunectes murinus*) from Demarara, purchased; a Mesopotamian Fallow Deer (*Cervus mesopotamicus*), a Gaimard's Rat Kangaroo (*Hypsiprymnus gaimardi*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

COMETS OF SHORT PERIOD.—Faye's comet was detected by Mr. Common at Ealing, with his large reflector, on August 2, in the position given by Dr. Axel Möller's ephemeris. The theoretical intensity of light at this date was 0.078, which rather exceeds that at the first and last observations at the appearance in 1850-51. The comet was very small and extremely faint when the sky was not quite black. The perihelion passage does not take place until January 22, 1881, but although long visible, the faintness of the comet will prevent its being well observed at any time with ordinary telescopes. Since its last appearance in 1873, when only four observations were secured, the effect of perturbation has been to lengthen the period 56.5 days, and to retard the arrival at perihelion by 38 days, the main part of this perturbation having been produced by Jupiter in 1875.

Prof. Oppölzer has published an ephemeris of Winnecke's comet from elements brought up to the next perihelion passage (December 4). The track of the comet will be so unfavourable that it is very doubtful if observations can be obtained at this return. If the comet be glimpsed at all, it is most likely to be during the month following December 20, for which period, that nothing may be wanting on his part, Prof. Oppölzer has given an accurately-calculated ephemeris, which he thinks will indicate the position within two minutes of arc. The three returns in 1858, 1869, and 1875 were connected, taking into account the perturbations by Jupiter and Saturn, and Herr A. Palisa determined the effect of the same planets (first-power perturbations) from 1875 to December 1, 1880. The effect of a resisting medium was likewise included, Prof. Oppölzer having, as we lately recorded, found evidence of its sensible influence on the motion of this comet, unless a correction be applied to the received mass of Jupiter, which seems hardly admissible to the extent required.

Encke's comet will again arrive at perihelion about the first week in November, 1881, after which no one of the comets of short period will be due until January, 1884, but before that time it may be anticipated that the comet of 1812 will have

arrived in these parts of space. A search for this body with the aid of Prof. Winnecke's sweeping ephemerides is desirable forthwith, the length of the revolution not appearing to be determinable within very narrow limits from the observations of 1812, and there being no other recognised appearance.

IS η CYGNI A VARIABLE STAR?—Writing in September, 1842, Sir John Herschel drew attention to this star, which he said appeared to have increased very considerably in magnitude since the date of Piazzi's observations. In 1842 it was "the principal star in the neck of the Swan, and of nearly the fourth magnitude, very conspicuous to the naked eye, and making in fact the only very distinctly seizable point between *Albireo* in the beak and the bright star γ in the body."

Piazzi, who observed the star nineteen times in right ascension and eleven times in declination, calls it 6.7 m. D'Agelet had estimated it 4.5 on July 29, 1783, and 5 on September 17, 1784; Lalande, 5 on August 12, 1793, and 4 on July 14, 1797; Bessel in his zone 436 on September 8, 1828, calls it 3 m. (!); Arge-lander and Heis, 4.5. Thus Piazzi's estimate appears to be lower than in the case of any other modern observer, but it is to be noted that Flamsteed reckoned the star no higher than the sixth magnitude.

η Cygni seems to deserve some attention at the hands of observers of the variable stars.

GEOLOGICAL NOTES

GEOLOGY OF BELGIUM AND THE NORTH OF FRANCE.—M. Moulon of Brussels has just published a work devoted to the general geology of Belgium. It describes the formations in chronological series, and is illustrated with maps, sections, and plates of the microscopic structure of rocks. A useful feature in it is a full bibliography of Belgian geology brought up to date. The new Government Geological Survey of Belgium has just published three sheets of maps, with sections, and explanatory notices. The maps, on a scale of $\frac{1}{250,000}$, are printed in chromolithography and on a novel plan. The ordinary topographical features—roads, fences, trees, houses, &c., are printed in different colours, according to the tertiary formation lying underneath. Thus the Wemmelen (Eocene) areas are at once recognisable by an orange topography, the Oligocene tracts by one in slate colour and the Anversian (Miocene) by one in crimson. The quaternary deposits overlying these formations are expressed by broad tints of colour. The maps are accompanied by "Notices Explicatives," which in the case of the Hoboken and Contich sheets appear as a well-printed 8vo pamphlet of 256 pages, and a sheet of superficial sections on a scale of $\frac{1}{100,000}$ for length and $\frac{1}{20,000}$ for height. The country delineated, and described lies on the low ground drained by the Escaut and Rupel, where, as little can be seen at the surface, a large series of borings has been made. The work has been accomplished by the Baron O. van Erborn, with the co-operation of M. Cogels. Prof. Gosselet of Lille has just issued the first fasciculus of an essay on the geology of the North of France and the neighbouring regions. It deals with the palaeozoic formations, and is accompanied with an atlas of plates of fossils, maps, and sections. No one is so competent as M. Gosselet to describe the older formations of that district which he has so sedulously studied for many years. His volume will be welcomed not only by students in Belgium and the North of France, but by geologists in other countries, who will find in it an admirable *résumé* of all that is known on this subject up to the present time, and references to the more important original memoirs where fuller information can be had.

THE RIGHT OF PRIORITY IN PALAEOLOGICAL NOMENCLATURE.—M. Gosselet, in a communication to the Société Géologique du Nord, calls attention to the great inconveniences which arise from the multiplication of names for the same species. He suggests the establishment of an international tribunal for judging of the value of each new species, and for registering it, with its name and the exact date of its publication. He thinks that the expenses of the journal of such a commission would be easily met by the subscriptions of scientific men, and that the duties of the commissioners would not be heavy, as they would need to be consulted only occasionally in doubtful cases, the ordinary routine work being performed by a secretary. As illustrations of the evils of the present system, or, rather, want of system, he cites the history of some Spirifers.

GEOLOGICAL SURVEY OF NEW JERSEY.—Mr. George H. Cook, State Geologist of New Jersey, has issued his unpretend-

ing but useful Annual Report for 1879. It contains a record of the development of the mineral industries of the State for last year, and is accompanied with a good map, on which are delineated the various soils as distributed over the area. The iron-bearing rocks of the Archean series extend from the north across New Jersey, and for several generations iron has been worked in this State. It is chiefly magnetic ore, and is searched for by means of the compass-needle, the attraction of which is noted. The commercial depression which began in 1873 has told heavily on the iron manufacture in the State. Of 200 mines and localities for ore only thirty have been kept in operation during the whole period of depression. There are now hopeful indications however of a revival of the trade. In the midst of information about building-materials, soils, mines, water-supply, and other topics, the writer of the Report continues to find a place for occasional interesting geological facts. His chapters are likely to be of much service to his fellow-citizens, who, it is pleasant to learn, show their appreciation of these Annual Reports, of which many of the former volumes are out of print.

GEOLOGICAL SURVEY OF ALABAMA.—The Geological Survey of this State is very modestly equipped. Its director, Prof. Eugene A. Smith, issues Annual Reports, which show, as minutely as the resources at his command will allow, the geological structure and economic resources of the different counties of the State. But he cannot make bricks without straw. It is short-sighted policy to require a Geological Survey to be made, and to equip it so economically that it cannot efficiently perform its work. In a country where the mineral resources remain in great measure undeveloped, it would be a wise expenditure of public funds to furnish means for making cuttings or borings where the crop of a seam of coal or vein of ore might be revealed at a short distance below the surface.

CENTRAL ASIAN GEOLOGY.—We find in the last number of the *Izvestia* of the Russian Geographical Society information as to the geological structure of the tracts to be crossed by the Southern Central Asian Railway. Altogether it is a flat and dry desert, covered with recent alluvial formations; the land becomes hilly only in the Mugojar Mountains. At Orenburg, and as far as Mertvyia Soli, there appear Trias sandstones and clays, which cover the Permian limestones, and gypsum with salt-springs (Sletskaia Zashchita). In the neighbourhood of Khanskiy Post we find a formation which probably will have an importance for the railway, namely, the Jura, which contains coal. At Ak-tube the shores of Teres-byutak, Yakshi, and Djaman-kargal Rivers are craggy, and consist of Permian and Trias rocks. The Mugojar Mountains are formed of pretty green and red jades, and the Djaman-tau Mountains of an augitic porphyry of syenite and granite; gneiss and mica-slate cover the granite on the eastern slope. A kind of fine white clay, being a product of the trituration of rocks, is found at the foot of the Mugojar Mountains on both slopes, and large accumulations of gravel in the form of mounds appear at a short distance from the mountains to the east. The Karakorum steppe affords a series of mounds of sand mostly covered with vegetation and often with very old trees. These mounds are usually motionless, only those which are quite devoid of vegetation (such being exceptional) are set in motion during heavy storms. Altogether the structure of the steppe appears thus: At the base a sandstone, probably Tertiary, horizontally stratified; above this, a clay with gypsum borrowed by former watercourses, and above it the sandy mounds. Water is found at a small depth. Sandstone and clays forming low elongated terraces, and belonging possibly to the Jurassic formation, appear in the neighbourhood of Kara-tougay on the Syr-daria River.

GEOLOGY OF GENEVA.—The Geological Map of the Canton of Geneva, on the scale of 1 to 25,000, together with a "Geological Description of the Canton," in two volumes, by Prof. Alphonse Favre, have been published under the auspices of the Geneva Agricultural Society—the map a year ago, and the "Description" only now. The map is well printed with eight colours very agreeable to the eye, and sufficiently transparent not to obstruct the topographical details. As to the geological value of this work, the name of M. Favre is a sufficient warrant. The learned professor has spent no less than twenty-seven years in the study of the formations of his Canton. The "Description" consists of four parts. The first gives general notions in geology; the second contains a detailed description of the formations of the Canton, namely, the Molasse, the glacial and the post-glacial deposits